

IN THE CLAIMS:

1. (Currently Amended) An electrical switching device comprising:

~~At~~at least one electrical contact able to be kept in a stable position by magnetic means, which contact comprises:

a first part comprising a first magnetizable element and a first contact zone associated with said magnetizable element,

a second moveable part comprising a first magnetic element and a second contact zone associated with said first magnetic element, the second movable part having a first stable position wherein a first electrical contact is kept closed between the first and second contact zones and a second stable position wherein said first electrical contact is kept open, and

electromagnetic actuating means acting on the second movable part for causing the latter to change position and comprising a first electromagnetic coil wound onto said first magnetizable element of the first part for attracting or repelling a first magnetic element of the second movable part and for changing the stable state of said movable part,

the first magnetizable element or the first magnetic element comprising a permanent magnetization part located in proximity to a contact zone for keeping the first electrical contact closed and for exerting a contact pressure between the first and second contact zones by a magnetic attraction exerted directly between the first magnetizable element and the first magnetic element when the movable part is in its first stable position, such that an axis between

the first magnetizable element and the first magnetic element passes through the first and second contact zones.

2. ~~(Currently Amended) The switching device according to claim 1~~ An electrical switching device comprising at least one electrical contact able to be kept in a stable position by magnetic means, which contact comprises:

a first part comprising a first magnetizable element and a first contact zone associated with said magnetizable element,

a second moveable part comprising a first magnetic element and a second contact zone associated with said first magnetic element, the second movable part having a first stable position wherein a first electrical contact is kept closed between the first and second contact zones and a second stable position wherein said first electrical contact is kept open, and

electromagnetic actuating means acting on the second movable part for causing the latter to change position and comprising a first electromagnetic coil wound onto said first magnetizable element of the first part for attracting or repelling a first magnetic element of the second movable part and for changing the stable state of said movable part,

the first magnetizable element or the first magnetic element comprising a permanent magnetization part located in proximity to a contact zone for keeping the first electrical contact closed and for exerting a contact pressure between the first and second contact zones by a magnetic attraction exerted directly between the first magnetizable element and the first magnetic element when the movable part is in its first stable position,

wherein the electromagnetic actuating means comprise a second electromagnetic coil wound onto a second magnetizable element of the first part for attracting or repelling the first a

second magnetic element of the second moveable part and for changing the stable state of said second movable part.

3. (Currently Amended) The switching device according to claim 2, wherein the first and second electromagnetic coils controllable by electrical pulses to generate reverse magnetic fields for changing the stable position of the second movable part change between first and ~~second~~ stable positions closing at least one electrical contact between a contact zone of the first part and a contact zone of the second movable part.

4. (Previously Presented) The switching device according to claim 2, wherein the first and second electromagnetic coils are controllable by electrical pulses to generate magnetic fields of the same direction for positioning the second movable part in a third stable position wherein the contact zones of the second movable part are not in electrical contact with the contact zones of the first part.

5. (Currently Amended) ~~The switching device according to claim 1.~~ An electrical switching device comprising:

\_\_\_\_\_ at least one electrical contact able to be kept in a stable position by magnetic means,

which contact comprises

\_\_\_\_\_ a first part comprising a first magnetizable element and a first contact zone associated with said magnetizable element,

\_\_\_\_\_ a second moveable part comprising a first magnetic element and a second contact zone associated with said first magnetic element, the second movable part having a first stable

position wherein a first electrical contact is kept closed between the first and second contact zones and a second stable position wherein said first electrical contact is kept open, and  
\_\_\_\_\_electromagnetic actuating means acting on the second movable part for causing the latter to change position and comprising a first electromagnetic coil wound onto said first magnetizable element of the first part for attracting or repelling a first magnetic element of the second movable part and for changing the stable state of said movable part,  
\_\_\_\_\_the first magnetizable element or the first magnetic element comprising a permanent magnetization part located in proximity to a contact zone for keeping the first electrical contact closed and for exerting a contact pressure between the first and second contact zones by a magnetic attraction exerted directly between the first magnetizable element and the first magnetic element when the movable part is in its first stable position,  
\_\_\_\_\_wherein the first part comprises a second magnetizable element for keeping the second movable part in the second stable condition.

6. (Previously Presented) The switching device according to claim 1, wherein the second movable part comprises at least one permanent magnet located in proximity to a contact zone.

7. (Previously Presented) The switching device according to claim 1, wherein the second movable part comprises a material comprising a mainly permanent magnetization part.

8. (Previously Presented) The switching device according to claim 1, wherein the permanent magnetization part has a magnetic induction greater than 1 tesla.

9. (Currently Amended) ~~The switching device according to claim 1~~ An electrical switching device comprising

at least one electrical contact able to be kept in a stable position by magnetic means,  
which contact comprises:

a first part comprising a first magnetizable element and a first contact zone associated with said magnetizable element,

a second moveable part comprising a first magnetic element and a second contact zone associated with said first magnetic element, the second moveable part having a first stable position wherein a first electrical contact is kept closed between the first and second contact zones and a second stable position wherein said first electrical contact is kept open, and

electromagnetic actuating means acting on the second moveable part for causing the latter to change position and comprising a first electromagnetic coil wound onto said first magnetizable element of the first part for attracting or repelling a first magnetic element of the second moveable part and for changing the stable state of said moveable part,

the first magnetizable element or the first magnetic element comprising a permanent magnetization part located in proximity to a contact zone for keeping the first electrical contact closed and for exerting a contact pressure between the first and second contact zones by a magnetic attraction exerted directly between the first magnetizable element and the first magnetic element when the moveable part is in its first stable position,

wherein the second moveable part has an elongate shape, is able to pivot, and comprises at least one contact zone and one magnetic attraction zone towards at least one end thereof.

10. (Previously Presented). The switching device according to claim 9, wherein the second movable part comprises at least one contact zone at a first end thereof and at least one permanent magnet at a second end thereof.

11. (Currently Amended) ~~The switching device according to claim 1~~ An electrical switching device comprising

at least one electrical contact able to be kept in a stable position by magnetic means,

which contact comprises:

a first part comprising a first magnetizable element and a first contact zone associated with said magnetizable element,

a second moveable part comprising a first magnetic element and a second contact zone associated with said first magnetic element, the second movable part having a first stable position wherein a first electrical contact is kept closed between the first and second contact zones and a second stable position wherein said first electrical contact is kept open, and

electromagnetic actuating means acting on the second movable part for causing the latter to change position and comprising a first electromagnetic coil wound onto said first magnetizable element of the first part for attracting or repelling a first magnetic element of the second movable part and for changing the stable state of said movable part,

the first magnetizable element or the first magnetic element comprising a permanent magnetization part located in proximity to a contact zone for keeping the first electrical contact closed and for exerting a contact pressure between the first and second contact zones by a

magnetic attraction exerted directly between the first magnetizable element and the first magnetic element when the movable part is in its first stable position,

\_\_\_\_\_ wherein the second movable part is flexible, is able to be fixed by a point situated in a central zone thereof, and comprises at least one contact zone and one magnet towards at least one end thereof.

12. (Previously Presented) The switching device according to claim 11, wherein the second movable part comprises at least one opening in said central zone.

13. (Currently Amended) ~~The switching device according to claim 1~~ An electrical switching device comprising

\_\_\_\_\_ at least one electrical contact able to be kept in a stable position by magnetic means,  
which contact comprises:

\_\_\_\_\_ a first part comprising a first magnetizable element and a first contact zone associated with said magnetizable element,

\_\_\_\_\_ a second moveable part comprising a first magnetic element and a second contact zone associated with said first magnetic element, the second movable part having a first stable position wherein a first electrical contact is kept closed between the first and second contact zones and a second stable position wherein said first electrical contact is kept open, and

\_\_\_\_\_ electromagnetic actuating means acting on the second movable part for causing the latter to change position and comprising a first electromagnetic coil wound onto said first magnetizable element of the first part for attracting or repelling a first magnetic element of the second movable part and for changing the stable state of said movable part,

the first magnetizable element or the first magnetic element comprising a permanent magnetization part located in proximity to a contact zone for keeping the first electrical contact closed and for exerting a contact pressure between the first and second contact zones by a magnetic attraction exerted directly between the first magnetizable element and the first magnetic element when the movable part is in its first stable position,

wherein:

the first part comprises the first magnetizable element associated with ~~a~~ said first contact zone and a second magnetizable element associated with a third contact zone, and

the second movable part comprises ~~a~~ said second contact zone towards a first end designed to be in contact with the first contact zone of the first part, and a fourth contact zone towards a second end designed to be in contact with the third contact zone of the first part, so that when in a first stable position of the movable part, the first and second contact zones form a closed contact and the third and fourth contact zones form an open contact, and in a second stable position of the movable part, the third and fourth contact zones form a closed contact and the first and second contact zones form an open contact.

14. (Previously Presented) The switching device according to claim 13, wherein the first, second, third and fourth contact zones are electrically connected to electrical connection means.

15. (Previously Presented) The switching device according to claim 13, wherein the second movable part comprises a first permanent magnet towards the first end thereof for operating in conjunction with the first magnetizable element of the first part, and a second permanent magnet



towards the second end thereof for operating in conjunction with the second magnetizable element of the first part.

16. (Previously Presented) The switching device according to claim 13, comprising maintaining means for keeping the second movable part in a third stable position wherein both the contact formed by the first and second contact zones and the contact formed by the third and fourth contact zones are open.

17. (Previously Presented) The switching device according to claim 16, wherein the maintaining means comprise a support element which includes a flat part located on the first part for receiving a first side of the second movable part, and pressure means for keeping a central zone of the second movable part in contact with said support element.

18. (Previously Presented). The switching device according to claim 17, wherein the pressure means is a spring.

19. (Previously Presented) The switching device according to claim 17, wherein the pressure means comprise a third permanent magnet and a third magnetizable element located on the support element and on the central zone of the movable part.

20. (Previously Presented) The switching device according to claim 1, comprising actuating means acting on the second movable part for causing it to change stable state.

21. (Currently Amended) ~~The switching device according to claim 1~~ An electrical switching device comprising

at least one electrical contact able to be kept in a stable position by magnetic means,  
which contact comprises:

a first part comprising a first magnetizable element and a first contact zone associated  
with said magnetizable element,

a second moveable part comprising a first magnetic element and a second contact zone  
associated with said first magnetic element, the second movable part having a first stable  
position wherein a first electrical contact is kept closed between the first and second contact  
zones and a second stable position wherein said first electrical contact is kept open, and

electromagnetic actuating means acting on the second movable part for causing the latter  
to change position and comprising a first electromagnetic coil wound onto said first  
magnetizable element of the first part for attracting or repelling a first magnetic element of the  
second movable part and for changing the stable state of said movable part,

the first magnetizable element or the first magnetic element comprising a permanent  
magnetization part located in proximity to a contact zone for keeping the first electrical contact  
closed and for exerting a contact pressure between the first and second contact zones by a  
magnetic attraction exerted directly between the first magnetizable element and the first  
magnetic element when the movable part is in its first stable position,

wherein the second movable part is flexible, is able to be fixed by a point situated in a  
central zone, and comprises at least one contact zone and a magnet having two ends for forming  
two contacts with contact zones of magnetizable elements of the first part, said two contacts  
capable of being closed simultaneously.

22. (Currently Amended) ~~The switching device according to claim 1~~ An electrical switching device comprising

At least one electrical contact able to be kept in a stable position by magnetic means,  
which contact comprises:

a first part comprising a first magnetizable element and a first contact zone associated with said magnetizable element,

a second moveable part comprising a first magnetic element and a second contact zone associated with said first magnetic element, the second moveable part having a first stable position wherein a first electrical contact is kept closed between the first and second contact zones and a second stable position wherein said first electrical contact is kept open, and

electromagnetic actuating means acting on the second moveable part for causing the latter to change position and comprising a first electromagnetic coil wound onto said first magnetizable element of the first part for attracting or repelling a first magnetic element of the second moveable part and for changing the stable state of said moveable part,

the first magnetizable element or the first magnetic element comprising a permanent magnetization part located in proximity to a contact zone for keeping the first electrical contact closed and for exerting a contact pressure between the first and second contact zones by a magnetic attraction exerted directly between the first magnetizable element and the first magnetic element when the moveable part is in its first stable position,

wherein said ~~at least one~~ first magnetizable element is sufficiently electrically conductive to permit an electric current designed to flow in at least one electrical contact to be conducted through it.

23. (Previously Presented) An electromagnetic relay having at least two stable states comprising first and second electrical contact inputs and control inputs,

at least one switching device according to claim 1, the first electrical contact input being connected to the second movable part, the second electrical contact input being connected to a first contact zone of the first part, and the control inputs being connected to at least a first electromagnetic coil located on at least a first magnetizable element of the first part.

24. (Previously Presented) A relay according to claim 23, comprising at least a second electromagnetic coil connected to the control inputs and located on at least a second magnetizable element of the first part.

25. (Previously Presented) A relay according to claim 23, having at least three stable states and comprising a third contact zone connected to a third contact input, and means for keeping the second movable part in a third stable position wherein the electrical contacts between the first, second, and third contact zones are open, the first and second electromagnetic coils for attracting and repelling to establish an electrical contact and for double repelling to open the contacts.

26. (Currently Amended) An electrical apparatus comprising at least first and second electrical contact inputs, comprising:

\_\_\_\_\_ at least one switching device according to claim 1 comprising at least one electrical contact able to be kept in a stable position by magnetic means, said contact comprising:

\_\_\_\_\_ a first part comprising a first magnetizable element and a first contact zone associated with said magnetizable element,

a second moveable part comprising a first magnetic element and a second contact zone associated with said first magnetic element, the second movable part having a first stable position wherein a first electrical contact is kept closed between the first and second contact zones and a second stable position wherein said first electrical contact is kept open, and  
electromagnetic actuating means acting on the second movable part for causing the latter to change position and comprising a first electromagnetic coil wound onto said first magnetizable element of the first part for attracting or repelling a first magnetic element of the second movable part and for changing the stable state of said movable part,  
the first magnetizable element or the first magnetic element comprising a permanent magnetization part located in proximity to a contact zone for keeping the first electrical contact closed and for exerting a contact pressure between the first and second contact zones by a magnetic attraction exerted directly between the first magnetizable element and the first magnetic element when the movable part is in its first stable position,  
said switching device having at least two stable positions, the first electrical contact input being connected to the second movable part, the second electrical contact input being connected to ~~the~~ the first contact zone of the first part, and  
a control circuit connected to at least a first electromagnetic coil located on ~~the~~ the first magnetizable element of the first part.

27. (Previously Presented) An electrical apparatus according to claim 26, wherein the switching device comprises at least a second electromagnetic coil connected to the control circuit and located on at least a second magnetizable element of the first part.

28. (Previously Presented) An electrical apparatus according to claim 26, wherein the switching device has three stable states and comprises a third contact zone connected to a third contact input and means for keeping the second movable part in a third stable position wherein the electrical contacts between the first, second, and third contact zones are open, the first and second electromagnetic coils for attracting and repelling to open the contacts.
29. (Previously Presented) An electrical apparatus according to claim 26, comprising actuating means for acting on the second moving part to make it change stable state.
30. (Previously Presented) An electrical apparatus according to claim 26, wherein the control circuit comprises at least one control input for receiving control signals.
31. (Previously Presented) An electrical apparatus according to claim 30, wherein the control signals applied to the input are selected from the group consisting of polarization signals, pulse duration signals, and number of pulse signals.
32. (Previously Presented) An electrical apparatus according to claim 26, wherein the control circuit comprises remote control input by communication bus for receiving control signals.
33. (Previously Presented) An electrical apparatus according to claim 26, wherein the control circuit comprises remote control receipt means for receiving control signals.

34. (Previously Presented) An electrical apparatus according to claim 26, wherein the control circuit comprises processing means for processing control signals and for controlling the electromagnetic coils according to said signals.

35. (Previously Presented) An electrical apparatus according to claim 34, wherein the processing means is for performing at least one function selected from the group consisting of remote control switch, timer and controlled switch functions.